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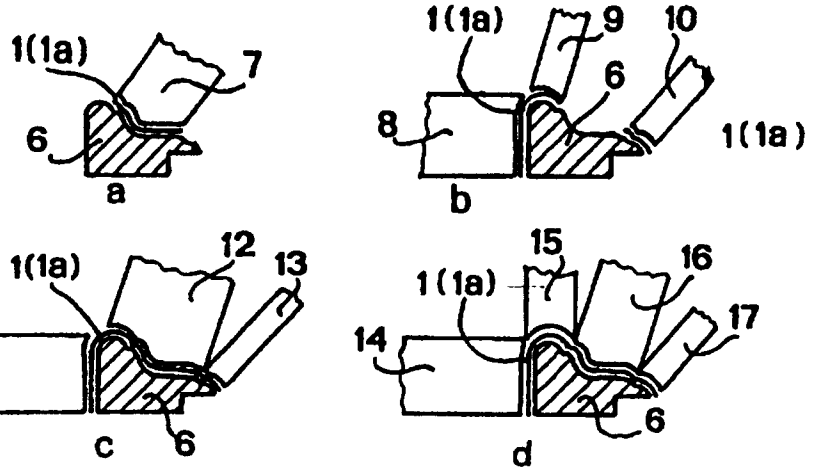
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: PROCESS FOR DECORATING SECTIONS MADE OF METAL, PLASTIC MATERIAL OR THE LIKE, AND RELATED APPARATUS

(57) Abstract

Process for variously decorating sections (6) made of plastic materials, composite materials and the like, comprising a step of pre-treatment for the preparation of the surface, a possible step of pre-painting, a possible step of pre-heating, a step of decoration by transfer from a strip-like flexible support (1, 1a) unwinding continuously from a first coil through the action of at least a rotating nip roll (7-17), suitably shaped, heated and thermostated, and lastly a possible step of sublimation and fixing, to obtain the transfer of the decoration and the polymerisation of colours. Apparatus for the formation of the decoration, comprising a first coil from which a flexible support (1, 1a) unwinds at least a rotating nip roll (7-17), shaped according to the section to be decorated, heated and thermostated, and at least a second coil for the rewinding of the flexible strip, once the decoration layer and the protection layer have been removed.



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PROCESS FOR DECORATING SECTIONS MADE OF METAL, PLASTIC MATERIAL OR THE LIKE, AND RELATED APPARATUS

DESCRIPTION

The present invention relates to a process for the decoration of sections from metals, plastic materials, composite materials, and the like, with geometric, floral, imitation wood or imitation marble pattern, and the like, either in one or more colours.

The present invention also relates to an apparatus suitable to realise said process.

As is known, sections intended for use in building components, such as doors and windows, curtain walls, balconies, handrails, town-fittings and the like, must have a high resistance against ageing and overcome several tests according to national and international norms and/or the provisions of the quality mark directives for the products to be used in architecture.

There has been realised a process for the production of large-size, variously decorated sections, which was the subject matter of the International Patent application PCT/EP96/00656, filed on 15.02.1996 by the same applicant Verniciatura Industriale Veneta S.p.A.; the process comprises the steps of winding of the artefact, previously subject to a surface treatment of pre-painting, anodic oxidation and the like, in a transfer support carrying the wished decoration;

covering the section wrapped in the support with a membrane from rubber or the like; vacuum formation by means of suitable ducts between the membrane and the section wrapped in the support, on prior interposition of means suitable to ensure air flow and outlet, so as to cause the support to closely adhere to the shape of the artefact, and complying means suitable to obtain the uniformity of the pressure exercised by the membrane; and lastly heating the whole so as to obtain the transfer of the pattern and the polymerisation of colours. Therefore, the process is rather complex and delicate and requires also a high manpower use, in particular to realise the windings of the artefact in the transfer support, in the means suitable to ensure air outlet in the vacuum creation step, and the permanently complying means to obtain a uniform pressure.

Object of this invention is to provide a process allowing to obtain large size sections having a length of up to 20 m, variously decorated, to be used for the production of doors and windows, also for outdoor use, having the requirements of quality, weatherproofing and resistance to ageing, provided for by the different international norms and by quality marks.

A further object of this invention is to provide a process for the realisation of sections, in particular from metal, aluminium an aluminium alloys, plastic materials, composite materials

(such as resins reinforced with carbon and or glass fibres and the like) provided with decorations in one or more colours, such as geometric, floral, imitation wood, imitation marble decorations, and also decorations comprising very complex patterns, exempt from defects such as deformations of pattern edges, smears, diffusion and superposition of colours and the like, and using a highly mechanised process with a low manpower need.

Still a further object of the invention is to provide an apparatus suitable for realising said process for the decoration of said sections.

These and still further objects and related advantages which will become apparent from the following description are achieved by a process for variously decorating sections from metal, plastic materials, composite materials and the like, which process, according to the present invention, comprises the following steps:

- pre-treatment, i.e. submitting the sections to at least an operation of surface preparation, such as degreasing, cleaning, anodic oxidation, neutralisation, chromate treatment, phosphochromate treatment, phosphating, nitrocobalt treatment, treatment with chrome-free products and the like, mechanical polishing and the like,

- possible pre-painting, i.e. application on the surface of said sections submitted to said pre-treatment of at least a paint layer, using fluid or powder paints, realising in this way a priming,

- possible pre-heating, i.e. submitting said pre-painted sections to heating at a temperature of 50-200°C,

- decoration, i.e. application, on the surface of said pre-treated and possibly pre-painted and pre-heated sections, of a decoration by transfer from a strip-like flexible support developing from at least a first coil, through the action of temperature and/or pressure generated by at least a rotary nip roller from elastically complying and suitably shaped, heated and thermostated material,

- possible sublimation and fixing, i.e. submitting to heating said sections comprising said decoration, at a temperature of between 100 and 300°C for 1 to 30 minutes, to obtain the transfer of the decoration and/or the pattern and the polymerisation of colours.

In case of sections from plastic materials, composite materials and the like, said pre-painting step is not always necessary, as the surface of said sections may be of a prefixed colour which acts as a primer for the decoration.

By said pre-painting, if any, there is obtained on the section the basic colour wished, and besides there are obtained one or

more priming protection layers suitable to prevent phenomena of diffusion, smears and the like of the substances and colours used in the decoration step, obtaining in this way the highest sharpness of the patterns, avoiding the danger of colour diffusion and superposition, and ensuring the best quality of the same decoration as well as its duration in the time and its weatherproofing.

According to an embodiment of the present invention, said decoration is applied on the surface of said pre-treated and possibly pre-painted and pre-heated section, by means of a thin layer of glue, which co-operates with said temperature and/or pressure action, and contributes to fixing the decoration.

According to another embodiment of the present invention, a transparent, decoration-protecting paint layer is applied on said decoration applied to the surface of said pre-treated and possibly pre-painted and pre-heated section, always through the co-operation of said temperature and/or pressure action.

After said possible sublimation and fixing step, the decorated section according to the process subject matter of this invention may be submitted to a further protection treatment by means of the application of a transparent, possibly fluid paint and subsequent air-, hot air -, UV- or IR radiation oven drying.

Said strip-like flexible support is constituted, according to this invention, by a continuous strip from paper, fabric, plastic materials or the like, carrying the pattern to be transferred on the side which will get in touch with the surface of the section to be decorated.

According to another embodiment of the present invention, said strip-like flexible support is constituted by a continuous strip from paper, fabric, plastic materials or the like, carrying on the side which will get in touch with the surface of the section to be decorated a first thin layer of glue and a second layer constituted by the decoration or the pattern to be transferred.

According to a further embodiment of the present invention, said strip-like flexible support is constituted by a continuous strip from paper, fabric, plastic materials or the like, carrying on the side which will get in touch with the surface of the section to be decorated a first thin layer of glue, a second layer constituted by the decoration or the pattern to be transferred, and a third layer constituted by a transparent, decoration-protecting film.

For instance, there has proved to be particularly advantageous a strip-like flexible support produced by the firm Miroglio Tessile, Strada Tagliata 18, Alba (CN), Italy.

The decoration is automatically applied, through the combined action of heat and pressure, on the section to be decorated during its translation on a horizontal plane (on chain or rollers). The decoration is transferred on a strip from paper, fabric, plastic materials or the like, continuously pressed by a rotary nip roller from silicon material, on the surface of the section. The roller is suitably heated by a casing provided with electric resistors. Such temperature is kept carefully constant and controlled by electronic means. When the decoration is associated to a glue layer and/or a protecting paint layer, also these layers are transferred onto the section by a single rolling.

Sections from deformable materials (plastic materials, composite fibreglass-reinforced materials, etc.) or sections from metal having easily bruisable or damageable areas (low thicknesses, cantilever-flanges, etc.) may also be decorated on prior reinforcement of the delicate areas by means of suitable pads (from wood, plastic materials, metals, etc.).

According to the complexity of the section to be decorated several rollers may operate at the same time. Each of these rollers may be suitably inclined to work in a well defined area of the section's cross-section, and it will be shaped according to the same shape as the partly decorated area.

After the transfer step, the decoration-comprising strip from paper, fabric or plastic material is automatically recovered

through a system of unwinding and rewinding coils. After the possible sublimation and fixing step, the whole cycle can be completed by the stay of the decorated sections in a ventilated air-, UV- or IR radiation oven. This step allows to achieve the ideal conditions to perform the complete sublimation of the decoration inks on the surface of the sections and their complete fixing. Sections remains in the oven for a time comprised between 1 and 30 minutes at temperatures comprised between 100 and 300°C.

The process according to the invention proved particularly advantageous to obtain sections from aluminium alloy with imitation wood or imitation marble decorations, comprising a first layer of primer forming the basic colour, and a second layer constituted by the decoration. Besides, according to the final use of the sections, there may be included a third layer constituted by a veil of decoration-protecting paint.

The invention will be described hereunder with reference to the attached drawing, given by way of non limiting illustration of the same invention, wherein:

Figure 1 shows schematically a type of strip-like flexible support according to the invention,

Figure 2 shows schematically another type of strip-like flexible support,

Figure 3 shows, always schematically, the realisation of the decoration step according to the invention, by using either only one rotary nip roller (a) or several nip rollers (b, c and d).

With reference to such figures, the strip-like flexible support 1 is constituted by a disposable continuous strip 5 from paper, fabric, plastic materials or the like, carrying the decoration to be transferred 2. According to an embodiment of the present invention, the strip-like flexible support 1a is constituted always by the disposable strip 5 carrying the decoration to be transferred 2 provided, on its surface facing the surface of the section to be decorated, a glue layer 3 which facilitates the adhesion of the decoration layer obtained with special sublimable organic inks and, on the opposite surface, by a thin veil of transparent paint 4 whose function is the protection of the underlying decoration 2.

The flexible layer 1 or 1a, continuously developing from a coil or the like (not shown) is pressed, with the surface carrying the decoration or the glue facing the surface of the section to be decorated 6, schematically shown in cross-section, by means of the shaped rotary nip rollers 7-17. As said, such rollers are suitably heated and thermostated. The combined action of heat and pressure, generated by the nip rollers, possibly helped by the action of glue 3, causes the adhesion of the layer constituted by the decoration or the

layers constituted by the decoration coupled with the protecting paint to the surface to be decorated of section 6 which translates longitudinally on a horizontal plane under the suitably shaped rotary nip rollers. The strip from paper, fabric, plastic materials, without the glue, decoration and possible protection paint layers, is then rewound on a second rewinding coil, while the coated section goes on to the subsequent step of sublimation and fixing in an air circulation-, IR- or UV oven or the like.

To sum up, tha apparatus suitable to realise the decoration step according to this invention comprises:

- a section to be decorated translatable on a plane in the direction of its longitudinal axis,
- at least a first coil on which there is wound up and from which there unwinds a strip-like flexible support comprising a strip from paper, fabric or plastic materials, a layer constituted by the decoration to be transferred and possibly a glue layer and/or a transparent protection paint layer or film,
- at least a rotary nip roller, elastically complying, shaped according to the profile of the section to be decorated, heated and thermostated, suitably to transfer by heating and/or pressure action, the layer constituted by the decoration and possibly the protecting paint layer on the surface of the section,

- at least a second coil on which the strip from paper, fabric or plastic materials is rewound, once the decoration and protection layers have been removed.

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CLAIMS

1. A process for variously decorating sections from metal, plastic materials, composite materials and the like, characterised in that it comprises the following steps:

- pre-treatment, i.e. submitting the sections to at least an operation of surface preparation, such as degreasing, cleaning, anodic oxidation, neutralisation, chromate treatment, phosphochromate treatment, phosphating, nitrocobalt treatment, treatment with chrome-free products and the like, mechanical polishing,

- decoration, i.e. application, on the surface of said pre-treated sections, of a decoration by transfer from a strip-like flexible support developing from at least a first coil, through the action of temperature and/or pressure generated by at least a rotary nip roller from elastically complying and suitably shaped, heated and thermostated material.

2. The process according to claim 1, characterised in that it comprises also the following steps:

- pre-painting, i.e. application on the surface of said sections submitted to said pre-treatment of at least a paint layer, using fluid or powder paints, realising in this way a priming,

- pre-heating, i.e. submitting said pre-painted sections to heating at a temperature of 50-200°C,

- sublimation and fixing, i.e. submitting to heating said sections comprising said decoration, at a temperature of between 100 and 300°C for 1 to 30 minutes.

3. The process according to claim 1, characterised in that said decoration is applied to the surface of said pre-treated sections by means of a thin layer of glue, which co-operates with said temperature and/or pressure action and contributes to the fixing of the same decoration.

4. The process according to claim 1, characterised in that a layer of transparent decoration-protecting layer is applied on said decoration applied to the surface of said pre-treated sections, always by means of the combined action of temperature and/or pressure.

5. The process according to claims 1 and 2, characterised in that said sections, after said decoration step and said possible sublimation and fixing step, are submitted to a further protection treatment through the application of a transparent paint and subsequent air-, hot air- or UV or IR radiation oven drying.

6. The process according to claim 5, characterised in that said transparent paint is a fluid paint.

7. The process according to claim 1, characterised in that said strip-like flexible support (1) is constituted, according to the present invention, by a continuous strip (5) from paper,

fabric, plastic materials, or the like, carrying the decoration or the pattern to be transferred (2) on the side that will get in touch with the surface of the section to be decorated.

8. The process according to claims 1 to 6, characterised in that said strip-like flexible support (1a) is constituted by a continuous strip (5) from paper, fabric, plastic materials, or the like, carrying on the side that will get in touch with the surface of the section to be decorated a first thin layer of glue (3) and a second layer constituted by the decoration or the pattern to be transferred (2).

9. The process according to claims 1 to 6, characterised in that said strip-like flexible support (1a) is constituted by a continuous strip (5) from paper, fabric, plastic materials, or the like, carrying on the side that will get in touch with the surface of the section to be decorated a first thin layer of glue (3), a second layer constituted by the decoration or the pattern to be transferred (2) and a third layer constituted by a transparent, decoration protecting film (4).

10. The process according to claims 1 and 2, characterised in that said strip-like flexible support is the support produced by the firm Miroglio Tessile of Alba (CN), Italy.

11. The process according to claims 1 and 2, characterised in that the sections from deformable plastic materials, composite materials and the like or the sections that have easily

déformable areas are decorated on prior reinforcement of the delicate areas by means of suitable pads from wood, plastic materials, metals, and the like.

12. Sections from aluminium alloy with imitation wood or imitation marble decorations, characterised in that they comprise a first layer of primer constituting the basic colour and a second layer constituted by the decoration.

13. The sections from aluminium alloy according to claim 12, characterised in that they comprise a third layer constituted by a transparent, decoration-protecting paint veil.

14. An apparatus for the realisation of the decoration step according to claim 1, characterised in that it comprises:

- a section to be decorated (6) translatable on a plane in the direction of its longitudinal axis,
- at least a first coil on which there is wound up and from which there unwinds a strip-like flexible support (1) comprising a strip (5) from paper, fabric or plastic materials, a layer constituted by the decoration to be transferred (2) and possibly a glue layer (3) and/or a transparent protection paint layer or film 4),
- at least a rotary nip roller /-17), elastically complying, shaped according to the profile of the section (6) to be decorated, heated and thermostated, suitably to transfer by heating and/or

pressure action, the layer constituted by the decoration and possibly the protecting paint layer on the surface of the section,

- at least a second coil on which the strip from paper, fabric or plastic materials is rewound, once the decoration and protection layers have been removed.

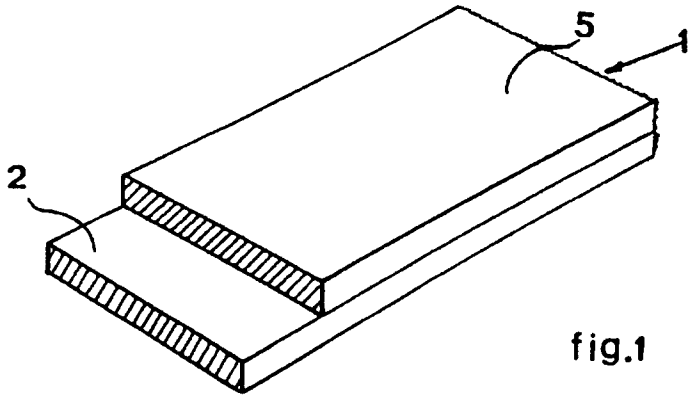

fig.1

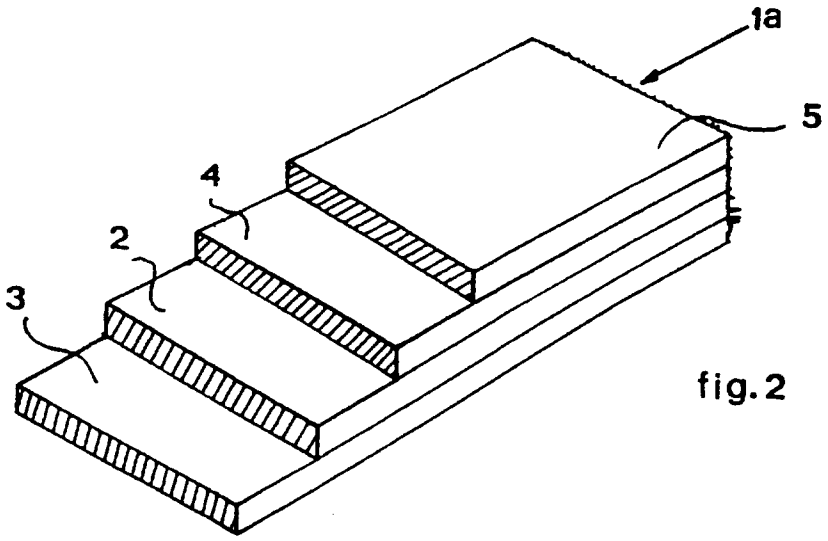

fig.2

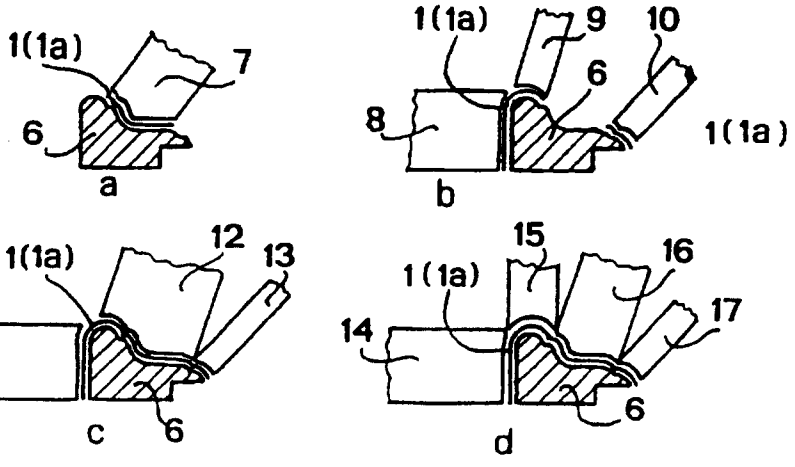

fig.3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 97/04377

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B44C1/17 B41M5/035

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B44C B41M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE,A,44 21 559 (OSMETRIC ENTWICKLUNGS- UND PRODUKTIONS- GMBH & CO. ET AL) 21 December 1995 see column 1, line 40 - column 7, line 55	1,2,5-7, 14
Y	---	3,4,8,9
X	GB,A,1 517 832 (REED INTERNATIONAL LIMITED) 12 July 1978 see page 1, line 42 - page 3, line 53	1,2,7
X	---	1,3,7,8
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X	---	1,5-7
	EP,A,0 625 433 (ILCAM SPA) 23 November 1994 see column 2, line 28 - column 6, line 14	

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 December 1997	06. 02. 98

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	DOOLAN G.J.

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INTERNATIONAL SEARCH REPORT

Inte "ional Application No
PCT/EP 97/04377

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO,A,91 05660 (AVERY INTERNATIONAL CORPORATION) 2 May 1991 see page 3, line 24 - page 13, line 19 ---	1,4,7-9, 14
X	DE,A,33 25 039 (HOESCH AG) 24 January 1985 see page 2, line 1 - page 4, line 16 ---	1,7,14
Y	EP,A,0 230 364 (MINNESOTA MINING AND MANUFACTURING COMPANY) 29 July 1987 see page 5, line 16 - page 7, line 12 see page 8, line 1 - page 11, line 20; example 1 -----	3,4,8,9

3

INTERNATIONAL SEARCH REPORT

In ational application No.
PCT/EP 97/04377

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims : 1-11, 14 A process for decorating sections made of metal, plastic materials, composite materials and the like. An apparatus for the realisation of the decoration process.

2. Claims : 12-13 Sections made of aluminium alloy bearing imitation wood or imitation marble decoration.

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-11, 14

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP 97/04377

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REVISED VERSION*

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
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A1

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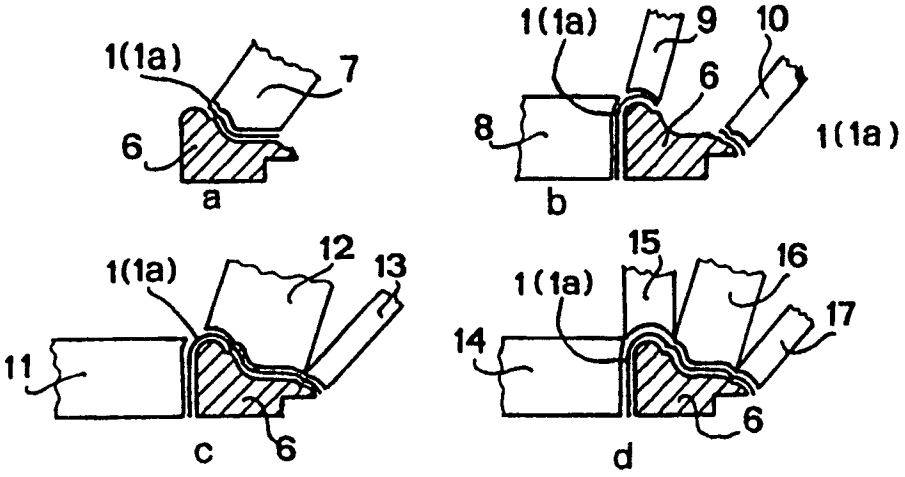
(54) Title: PROCESS FOR DECORATING SECTIONS MADE OF METAL, PLASTIC MATERIAL OR THE LIKE, AND RELATED APPARATUS

(57) **Abstract**

Process for variously decorating sections (6) made of metal, plastic materials, composite materials and the like, comprising a step of pre-treatment for the preparation of the surface, a possible step of pre-painting, a possible step of pre-heating, a step of decoration by transfer from a strip-like flexible support (1, 1a) unwinding continuously from a first coil through the action of at least a rotating nip roll (7-17), suitably shaped, heated and thermostated, and lastly a possible step of sublimation and fixing, to obtain the transfer of the decoration and the polymerisation of colours. Apparatus for the formation of the decoration, comprising a first coil from which a flexible support (1, 1a) unwinds at least a rotating nip roll (7-17), shaped according to the section to be decorated, heated and thermostated, and at least a second coil for the rewinding of the flexible strip, once the decoration layer and the protection layer have been removed.



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VERSION

INTERNATIONAL SEARCH REPORT

Ir ational Application No
PCT/EP 97/04377

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B44C1/17 B41M5/035 B44F9/02 B44F9/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B44C B41M B44F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 21 559 A (OSMETRIC ENTWICKLUNGS- UND PRODUKTIONS- GMBH & CO. ET AL) 21 December 1995 see column 1, line 40 - column 7, line 55	1,2,5-7, 14
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X	EP 0 625 433 A (ILCAM SPA) 23 November 1994 see column 2, line 28 - column 6, line 14	1,5-7

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
3 March 1998	03.04.98

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Doolan, G

INTERNATIONAL SEARCH REPORT

national Application No
PCT/EP 97/04377

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 5 113 786 A (M. R. HAYSLIP) 19 May 1992 see column 1, line 10 - column 4, line 50	12
X	FR 2 641 021 A (D. J. ARNOUX) 29 June 1990 see the whole document	12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 97/04377

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims : 1-11, 14 A process for decorating sections made of metal, plastic materials, composite materials and the like. An apparatus for the realisation of the decoration process.
2. Claims : 12-13 Sections made of aluminium alloy bearing imitation wood or imitation marble decoration.

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

national Application No
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